1. Determine the force in each member of the truss. (25%)

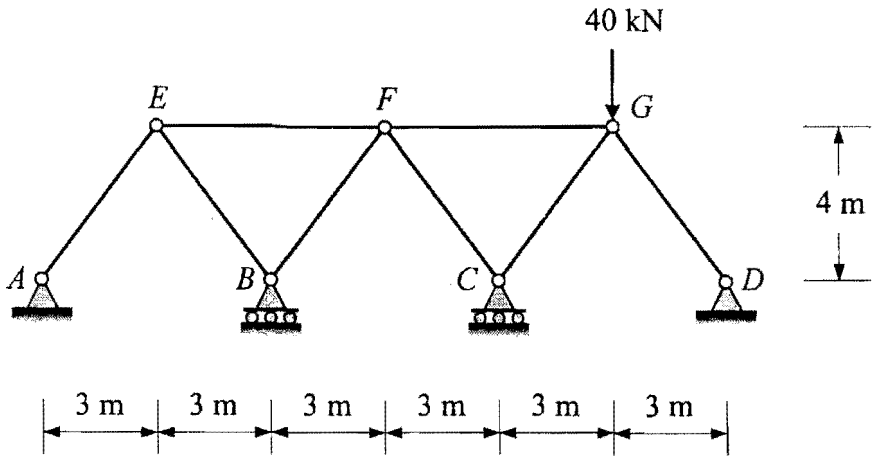

Figure 1

2. The beam *ABCD* is subjected to concentrated loads P_B and P_C at *B* and *C*, respectively. Using the conjugate-beam method, determine the ratio P_B/P_C so that the angle of rotation at *D* will be zero. The flexural rigidity *EI* is constant. (25%)

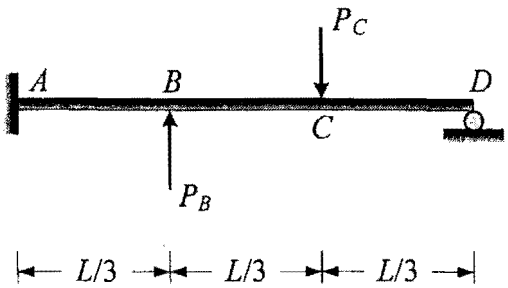

Figure 2

3. Use the unit-load method (also known as the method of virtual work) to determine the horizontal deflection at C of the frame. The members are pin connected at A, B and D, and fixed connected at C. $E = 200$ GPa, $I = 350(10^6)$ mm^4. (25%)

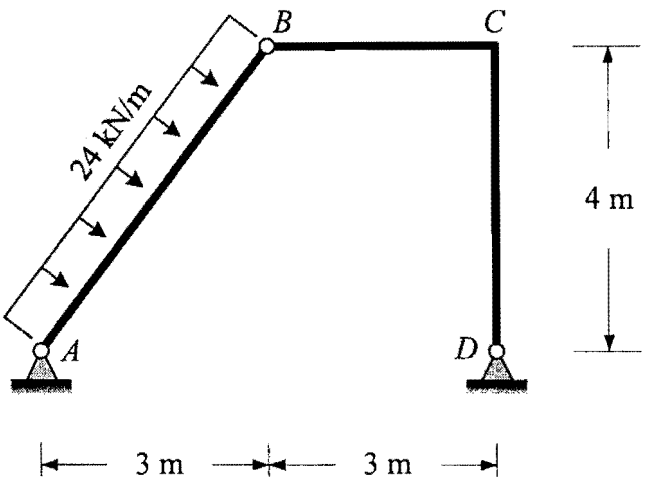

Figure 3

4. Use the slope-deflection method to determine the moments at the ends of each member, and then draw the moment diagram for the frame. The support at C is a roller guide and A is fixed. EI is constant. (25%)

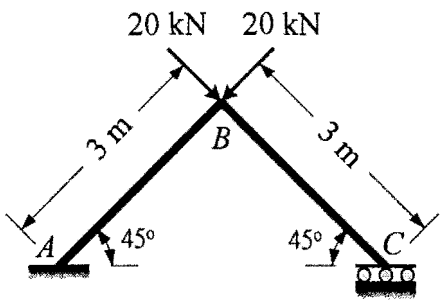

Figure 4